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food habits of the same birds as are here studied were presented in a paper by the same author, published in 1913 under the title "The Food of Some British Wild Birds". The method used in the earlier paper in estimating the crop and stomach contents was that known as the numerical method. The present paper is the result of a re-investigation, using the volumetric method. Under the heading of methods, a discussion of the numerical as compared with the volumetric method is given, with the conclusion that the ratio of each element to the average capacity or cubic contents of the bird's stomach gives the most accurate idea of the relative proportions of each kind of food. It is pointed out that this method, so widely used in the United States, is here practiced for the first time in connection with British birds. An attempt is thus made to state in definite figures the actual percentages of the different kinds of food consumed by each species during a whole year. The evidence is presented after an examination of 3670 adult specimens obtained during each month of the year, and 595 nestlings.

The treatment under each species consists of introductory statements, followed by post mortem records, food of nestlings, and a conclusion based on the evidence as to the economic status of the species. The change in method leads the writer to change his stand regarding the economic status of the Missel Thrush. The judgment after a numerical analysis of the food led to the statement that the Missel Thrush "for four months in the year does more harm than is counterbalanced during the remainder of the year". The judgment after a volumetric analysis leads to the statement: "In spite of its depredations in fruit orchards, this bird must at present be regarded on the whole as beneficial".

It is pointed out that the House Sparrow is one of the best-known birds in history, probably being known to people of whom we have no written records. "When writing was invented the Sparrow was selected for the hieroglyphic symbolising enemy, and proofs of its destructive habits have been cited by certain authors showing that it has been the enemy of mankind for more than five thousand years". Investigation of the food habits of this bird does not alter the attitude taken many years ago. The Rook is shown to be more harmful than beneficial, in the present abundance of this species. The injury to seed corn and other crops by the Skylark is far outweighed by the benefits it confers in destroying injurious insects.

The Green Woodpecker is shown to destroy large numbers of injurious insects and to seldom, if ever, attack sound trees. It is, therefore, "deserving of every protection". The injuries inflicted by the Sparrow Hawk "are considerably in excess of the benefits it confers, and in consequence it should be afforded no protection". The Kestrel is a bird "certainly deserving of very strict protection". The Wood Pigeon probably consumes 57 pounds of food per year. Of this about 35½ pounds is grain, clover, roots and pulse, 20½ pounds of weeds, grass, earth-worms, etc., and about one pound of slugs, snails and insects. The writer, therefore, advocates the destruction of this bird as a pest. The food habits of the Lapwing demonstrate the need for "prohibition of the taking or killing of this bird or its eggs throughout the year".

Of the nine species of wild birds the House Sparrow and the Wood Pigeon are shown to be distinctly injurious. Because of their abundance, two others, the Rook and the Sparrow Hawk, are also injurious. One, the Missel Thrush, although as a rule beneficial, is sometimes locally too numerous. The Skylark, the Green Woodpecker, the Kestrel and the Lapwing are highly beneficial. Strong repressive measures against the first category, the withholding of protection from those of the next two categories, and the strict protection of the four beneficial birds are advocated. The paper is illustrated by seventeen diagrams, showing the proportional amounts of the different kinds of food, and a bibliography, citing twenty-three papers, is appended.

Dr. Collinge in casting aside the numerical method for the American method of computing the stomach contents of birds makes it appear probable that the latter will be universally used in the near future, with the result that the work of economic ornithologists throughout the world will be directly comparable. Heretofore, because of the wide difference in method it has been practically impossible for Americans to profit by the work of Europeans.—HAROLD C. BRYANT, *Museum of Vertebrate Zoology, Berkeley, California, January 1, 1919.*

MINUTES OF COOPER CLUB MEETINGS

SOUTHERN DIVISION

SEPTEMBER.—The meeting of September 26, 1918, was called to order by President Miller, with members Daggett, Holland, Howard, Howell, Law, Mrs. Law, Lelande, Little, Owen, Reis, and Willett

present, and as visitors Mesdames Holland, Howard, and Howell. On motion by Willett, seconded by Lelande, those members nominated at the August meeting were duly elected.

Names of new members were proposed as follows: J. J. Furber, Klamath Falls, Oregon, Dr. L. E. Hibbard, Burns, Oregon, and Dr. Geo. W. Field, Washington, D. C., proposed by Geo. Willett; H. L. Dillaway, Everett, Washington, by Walter P. Taylor. From the Northern Division: Maria V. Ballard, Spokane, Washington, by Dr. H. C. Bryant.

Mr. George Willett told his summer observations of breeding conditions at Malheur Lake, Oregon, and of the effort being made by real estate promoters to have this lake drained. Investigations indicate that the land is an alkaline basin, too saline for agricultural purposes, since there is poor drainage, and therefore no legitimate reason exists for its reclamation. Furthermore, there are untold acres of untilled land on its borders, and the abutting property owners around the lake are practically unanimous in opposition to draining the lake, foreseeing their own ruin in such procedure.

On motion by Lelande, seconded by Daggett, a resolution was passed protesting at the proposed drainage plans, and copies ordered sent to the Governor of Oregon and to the State Land Commissioner of Oregon.

Mr. A. B. Howell, just returned from four months in southern Arizona for the Biological Survey, gave some side lights on his trip. Travel was difficult, and two years drouth made waterholes scarce. On the other hand, cloudbursts complicated matters at times. His entire outfit, except specimens, was submerged by one. A broken differential 70 miles from a railroad and 24 miles from a water hole, added to the spice of Arizona's worst desert. Mammalian life had been decimated, and many birds did not breed at all this spring. While he made no new state records of birds, there were many new local records. His route zigzagged across the portion of Arizona lying south of the Southern Pacific Railroad, from Yuma to Tucson, ending with a month in the Catalina Mountains.—J. EUGENE LAW, *Secretary, pro tem.*

DECEMBER.—Regular monthly meeting of the Cooper Club, Southern Division, was held at the Museum of History, Science and Art, at 8:00 P. M., December 26, 1918. Members present were: Messrs. Appleton, Barnes, Brouse, Chambers, Hanaford, Rich, Reis,

Robertson, Willett and Wyman. In the absence of President Miller, Vice-president Willett occupied the chair.

Minutes of the November meeting were read and approved, and October minutes of the Northern Division were read. On motion by Dr. Rich, seconded by Mr. Chambers, the Secretary was instructed to cast an electing ballot for the parties whose names were presented at the previous meeting. New names presented were: Raymond Jones Middleton, Jeffersonville, Penn., and Charles Irving Rawson, Oxford, Mass., by W. Lee Chambers.

The death of Olive Thorne Miller, for years a Cooper Club member, having been announced, it was deemed proper that the Club should pass resolutions of regret, and Dr. L. H. Miller was appointed a committee of one to draft such resolutions. Owing to the small attendance it seemed best to defer nomination of officers for the coming year until the January meeting, and on motion by Mr. Chambers such postponement was ordered.

Formal business matters disposed of, Judge Barnes favored the members with an interesting talk on his experiments with the Trumpeter Swan, and numerous species of wild geese, in captivity. He spoke also of conditions affecting the nesting of the Wood Duck, on the Illinois River. Adjourned.—L. E. WYMAN, *Secretary.*

NORTHERN DIVISION

NOVEMBER.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology on the evening of November 21, 1918, at eight o'clock. Dr. Evermann presided, and the following members were present: Messrs. Anderson, Bryant, Cohen, Garlough, Grinnell, Hansen, Jacobson, Kibbe, Labarthe, Lastreto, Leggett, Stivers, Swarth; Mesdames Allen, Bamford, Ferguson, E. Ferguson, Griffin, Grinnell, Kibbe, and Wythe. The visitors present were: Mrs. Evermann, Mrs. Labarthe, Mrs. Swarth, Miss Alice Wythe and Mr. Humphreys.

The minutes of the October meeting were read and approved. Mr. A. S. Kibbe reported for the Committee on the Conservation of Wild Life.

The Club then enjoyed the privilege of hearing Dr. C. G. Stivers, Captain, Medical Reserve Corps, Aviation Department, who read entertaining selections from his exhaustive paper on "Bird Flight and Human Flight". Practical demonstrations of some

of the fundamental principles of aeroplane construction and of tests used to determine the fitness of men for aeroplane service were also most interesting. After discussion the Club adjourned.—AMELIA S. ALLEN, *Secretary*.

DECEMBER.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology, December 19, 1918, at eight o'clock. Dr. Evermann presided and the following members and visitors were present: Messrs. Carriger, De Groot, Dixon, Grinnell, Hunt, Jacobsen, Kibbe, Labarthe, Lastreto, Leggett, Mailliard, Pemberton, Ray, Wheeler, Wright; Mesdames Allen, Kibbe, Knappen, and Schlesinger; visitors: Mrs. Evermann, Miss Mary Elizabeth Grinnell, Mrs. Pemberton, Mrs. Swarth and Mr. Lincoln.

The minutes of the November meeting were read and approved, and the September and November minutes of the Southern Division were read. Members already elected by the Southern Division were approved, and the name of E. B. Humphreys, Alameda, proposed by Donald A. Cohen, was presented.

Mr. Kibbe then appealed to the Club to cooperate with the Audubon Association of the Pacific in urging the passage of an ordinance to license cats in the city of Berkeley. Dr. Grinnell moved that the Chair appoint a member of the Cooper Club to join with Mr. Kibbe in working out a feasible mode of procedure and to report at the next meeting. The motion was seconded and carried. Mr. Roswell S. Wheeler was appointed.

A letter from the Pacific Division of the American Association for the Advancement of Science asking that the Cooper Club hold meetings at the time of the general meeting of the Association in the spring was read and favorably acted on. Mr. Mailliard then reported for the committee which had been appointed to recommend a proper depositary for ornithological notes, photographs, etc. The committee opposed the plan of dividing materials between a northern and a southern center, and on motion of Mr. Swarth, seconded by Mr. Mailliard, the Division voted in favor of appointing the Business Manager, Mr. Chambers, custodian of all literary and other materials deposited with the Club.

Nominations for officers for the ensuing year resulted in the placing of the following names before the Club: for President, Dr. Barton W. Evermann; for Vice-President, Mr. Jules Labarthe; for Secretary, Mrs. James T. Allen.

Mr. J. R. Pemberton then gave a most interesting talk on "Field Observations on Birds of Patagonia." Adjourned.—AMELIA S. ALLEN, *Secretary*.

JANUARY.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology, January 16, 1919, at eight o'clock. Dr. Evermann presided, and the following members were present: Messrs. Bryant, Carriger, Dixon, Grinnell, Hansen, Hunt, Jacobson, Kibbe, Law, Loomis, Morley, Noack, Pemberton, Ritter, Swarth and Wright; Mesdames Allen, Bamford, Bridges, Culver, Griffin, Grinnell, Kibbe, Law, Lueddemann, and Wythe. Visitors recognized were Mrs. Bryant, Mrs. Evermann and daughter, Miss Ripley, Mrs. Pemberton, Mr. Bridges, Mr. Lincoln, Mrs. Noack and son, and Mr. Babcock and son. The minutes of the preceding meeting were read and approved, and those of the December meeting of the Southern Division were read.

Mr. Humphreys was elected to membership, and the following were proposed: Professor Ivan C. Hall, Berkeley, by Dr. Grinnell; John O'Connell, San Francisco, by J. S. Hunter; and Walter Sellner, San Francisco, by J. S. Hunter.

Resolutions of condolence relating to the death of Mrs. Nace, drawn up by Dr. Joseph Grinnell, were adopted on motion of Dr. Bryant, seconded by Miss Culver.

Since Mr. Wheeler was absent, Mr. Kibbe reported for the committee appointed to investigate the possibility of introducing an ordinance requiring that cats be licensed in Berkeley. The committee began its work by gathering data from other cities where such an ordinance has been adopted.

Elections for the year 1919 resulted as follows: Dr. Barton W. Evermann, President; Mr. Jules Labarthe, Vice-president, Mrs. James T. Allen, Secretary.

Mr. Swarth then reviewed the history of the study of the Fox Sparrow, showing an interesting series of type-specimens, many of them borrowed from eastern collections.

Mr. F. C. Lincoln, Pigeon Expert of the Western Department, United States Army, then spoke on the Military Use of the Homing Pigeon, while two of the birds, removed from the carrier baskets used by the army, watched the audience from their collapsible aviary and winked knowingly as the members of the Club began to discuss the homing instinct. Adjourned.—AMELIA S. ALLEN, *Secretary*.